Service Desk Ticket Analysis Using Machine Learning

Modern IT environments generate a high volume of service desk tickets daily, ranging from minor issues to critical incidents. Managing this flow efficiently is essential for maintaining service quality and ensuring rapid response. Traditional ITSM frameworks like ITIL provide structured processes, but as ticket volumes and complexity increase, manual handling leads to delays, misclassifications, and reduced customer satisfaction.

This project explores how **machine learning** can be applied to **service desk ticket analysis** to enhance operational efficiency, improve accuracy, and embed predictive intelligence into IT service management workflows.

Dataset Link

Objectives

The initiative focuses on four key areas where data-driven models can significantly improve service desk operations:

1. **High-Priority Ticket Prediction:** Build predictive models to identify tickets that are likely to escalate into Priority 1 or 2 incidents, allowing teams to act proactively and minimize impact.
2. **Incident Volume Forecasting:** Use historical time-based data to forecast ticket volumes quarterly and annually, supporting better resource planning and capacity management.
3. **Automated Classification of Tickets:** Develop classifiers to automatically assign appropriate priority levels and departments, reducing delays caused by misrouted or miscategorized tickets.
4. **RFC and Misconfiguration Risk Prediction:** Predict the likelihood that a ticket will lead to a Request for Change (RFC) or result in a system misconfiguration, enabling smarter change control decisions.

Feature Analysis

Feature Name	Feature Description
Asset_ID	Unique identifier of the impacted configuration item.
Asset_Group	Main classification of the configuration item.
Asset_Subtype	Specific subtype under the configuration item group.
Budget_Code	Financial or project-linked reference code.
Ticket_ID	Unique incident reference number.
Ticket_State	Current state of the ticket (e.g. Open Closed).
Business_Impact	Assessed level of disruption caused to business operations.
Time_Criticality	Degree of urgency for the issue to be addressed.
Response_Priority	Combined score reflecting how quickly a resolution is required.
Client_Contact_Score	Numeric representation of customer engagement or frequency.
Issue_Type	The nature or category of the issue reported.

Knowledge_Link_ID	Associated knowledge base article for issue resolution.
Monitoring_Origin	Indicates if the issue originated from monitoring/alert tools.
Team_Reassignments	Number of times the ticket changed hands between resolver groups.
Logged_At	Date and time when the ticket was originally logged.
Reinitiated_At	Timestamp indicating when the issue was reopened.
Solution_Completed_At	Time when a fix was implemented.
Final_Closure_At	Time when the ticket was completely closed.
Effort_Duration_Hrs	Cumulative effort in hours spent in handling the issue.
Closure_Rationale	Reason or explanation for closing the ticket.
Interaction_Tally	Total count of user interactions linked to the ticket.
Interaction_Ref	Unique ID(s) for the linked user interactions.
Incident_Link_Count	Number of related incidents tied to the main issue.
Change_Link_Count	Number of RFCs (Requests for Change) associated with this incident.
Change_Ref_ID	Unique ID referencing related change requests.